

Two New Records and Three Rare Species of Korean Arctiidae (Lepidoptera)

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Abstract *Atolmis rubricollis* (L.) and *Arctia flavia* (Fuessly) are reported for the first time from the Korean Peninsula. Three unknown species from S. Korea, *Diacrisia irene* (B.), *Hyphoraia aulica* (L.), and *Parasemia plantaginis* (L.) are discovered from N. Korea. Colour photos of adults and genitalia are provided.

Key words Faunistics, Lepidoptera, Arctiidae, new records, Korea

INTRODUCTION

Arctiidae (Lepidoptera, Noctuoidea) in the Korean peninsula comprises presently 78 species (Park 2000). The list is far from complete and further species are likely to be added. In the comparison with the adjacent countries, 106 arctiids are known from Japan (Inoue *et al.*, 1982) and more than 90 species are known from the South-east part of Russia (Dubatolov *et al.*, 1993; Dubatolov, 1996). In this study, two species, *Atolmis rubricollis* (L.) and *Arctia flavia* (Fuessly) which were collected from N. Korea, are reported for the first time from the Korean peninsula. Three species which were not known from S. Korea, *Diacrisia irene* (B.), *Hyphoraia aulica* (L.), and *Parasemia plantaginis* (L.) are discovered from N. Korea. The first species, *D. irene*, was first recorded under the name of *Nemeophila russula* Linneus by Fixen (1887), and again reported by Kishida & Inomata (1981), based on N. Korean material, and cited by Park (2000), while the latter two species have not been found in Korea, since its first record by Kishida & Inomata (1981). For all these species, available information including bibliographies, brief descriptions, collecting data, worldwide distribution, hosts, and remarks are given.

The moths were collected during the Polish Entomological Expeditions to North Korea in the years 1985 and 1989 (Pawłowski & Tomek, 1997; Pawłowski *et al.*, 2000). All the material examined are deposited in the collection of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland.

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SYSTEMATIC ACCOUNTS

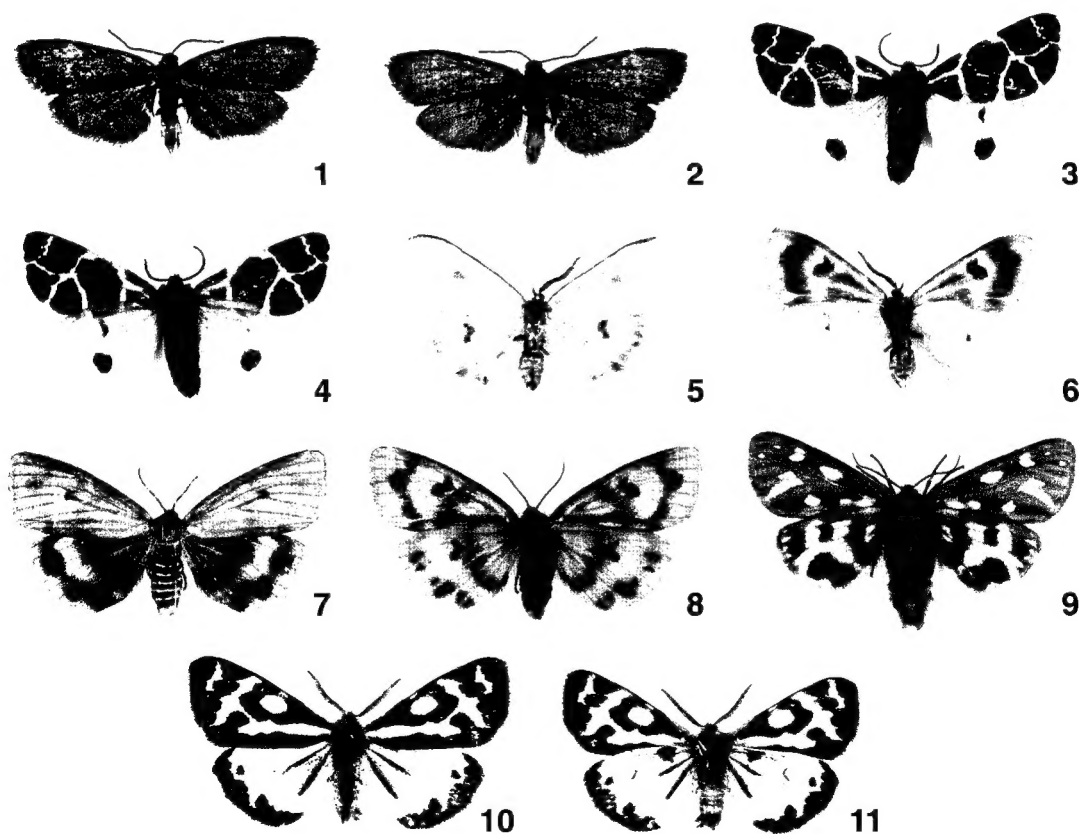
Atolmis rubricollis (Linnaeus, 1758)

(Figs 1-2, 12, 12a)

Phalaena rubricollis Linnaeus, 1758. Syst. Nat. (ed. 10) 1: 511.

Male. Length of forewing 11.7 mm. Head, thorax, wings, and abdomen except the last segment black; patagia rusty-red; last abdominal tergite as well as all sternite orange-yellow.

Male genitalia (Figs 13, 13a). Uncus long, narrow, weakly sclerotized. Tegumen broad, much larger than vinculum. Valva relatively large, divided into membranous costal part and sclerotized saccus; saccus with two well-developed short process, one beyond half and the other at end. Vinculum narrow, tipped with a long, sharp process distally. Aedeagus relatively large; cornuti consist of more than 10



Figs 1-11. Adults: 1-2, *Atolmis rubricollis* (L.), ♂; 3-4, *Arctia flavia* (Fuessly), ♂; 5-6, *Diacrisia irene* (B.), ♂; 7-8, *Diacrisia irene* (B.), ♀; 9, *Hyphoraia aulica* (L.), ♀; 10-11, *Parasemia plantaginis* (L.), ♂.

short, strong setae.

Material examined. 1 ♂, N. Korea; Sandjiyon (= Samjiyon 41° 50'N, 128° 19'E; 1450 m; 10 VII 1985 (E. Palik).

Distribution. Korea (new record), Palaearctic species known from most of the European countries, Siberia (except its northern part), and China.

Host plant. Different species of arboreal lichens (especially growing on *Picea abies* (L.)) (Buszko, 1997).

Remarks. This easily recognizable species, although it is common throughout Palaearctic Region, is reported for the first time from Korea. The male of Korean specimen is markedly smaller than European ones.

***Arctia flavia* (Fuessly, 1779)**

(Figs 3–4, 13, 13a)

Phalaena (*Bombyx*) *flavia* Fuessly, 1779. Mag. F. Liebhaber dEnt. 2: 70, pl. 1.

Arctia flavia campestris Graeser, 1892. Berl. Ent. Ztg. 37: 212.

Arctia flavia uralensis Heyne, 1899. Soc. Ent. 14: 98.

Arctia flavia lederi Bang-Haas, 1927. Horae Macrolep. 1: 75, pl. 9.

Arctia flavia baicalensis Bang-Haas, 1927. Horae Macrolep. 1: 74, pl. 9.

Male. Length of forewing 27.2 mm. Forewing dark, with narrow white stripes; hindwing light-yellow, with blackish round blotch and a much smaller sickle-shaped dot.

Male genitalia (Figs 14, 14a). Uncus long, evenly tapering to apex. Valva relatively broad; costa expressed strongly in the basal part of valva; broad, long protuberance medially, covered with dense, long spines; cucullus elongate at end, about 1/4 of valva in length. Aedeagus robust, shorter than valva, with numerous spines in vesica.

Material examined. 1 ♂, N. Korea; Kumgangsan (= Mt. Kumgang-san 38° 30'–38° 45'N, 128° 00'–128° 20'E; 17 VII 1985 (J. Kozieliec).

Distribution. Korea (new record), Palaearctic species known from the western Europe (France) to the Russian Far East (Primorye, the Magadan region, except northern parts of Siberia), and to the south reported from China and Mongolia.

Host plants. Various herbaceous plants—mainly *Urtica* L., *Cotoneaster* L., *Taraxacum* L. from Europe (Forster & Wohlfahrt, 1960).

Remarks. Specimen from Mt. Kumgang-san represents more or less narrower, white stripes on the forewing, and reduced dark markings on the hindwing. A further study is needed with more material.

***Diacrisia irene* Butler, 1881**

(Figs 5–8, 14, 14a, 16, 16a)

Diacrisia irene Butler, 1881. Trans. Ent. Soc. Lond. 1881: 6.

Diacrisia rishiriensis Matsumura, 1930. Insecta Matsum. 5: 35.

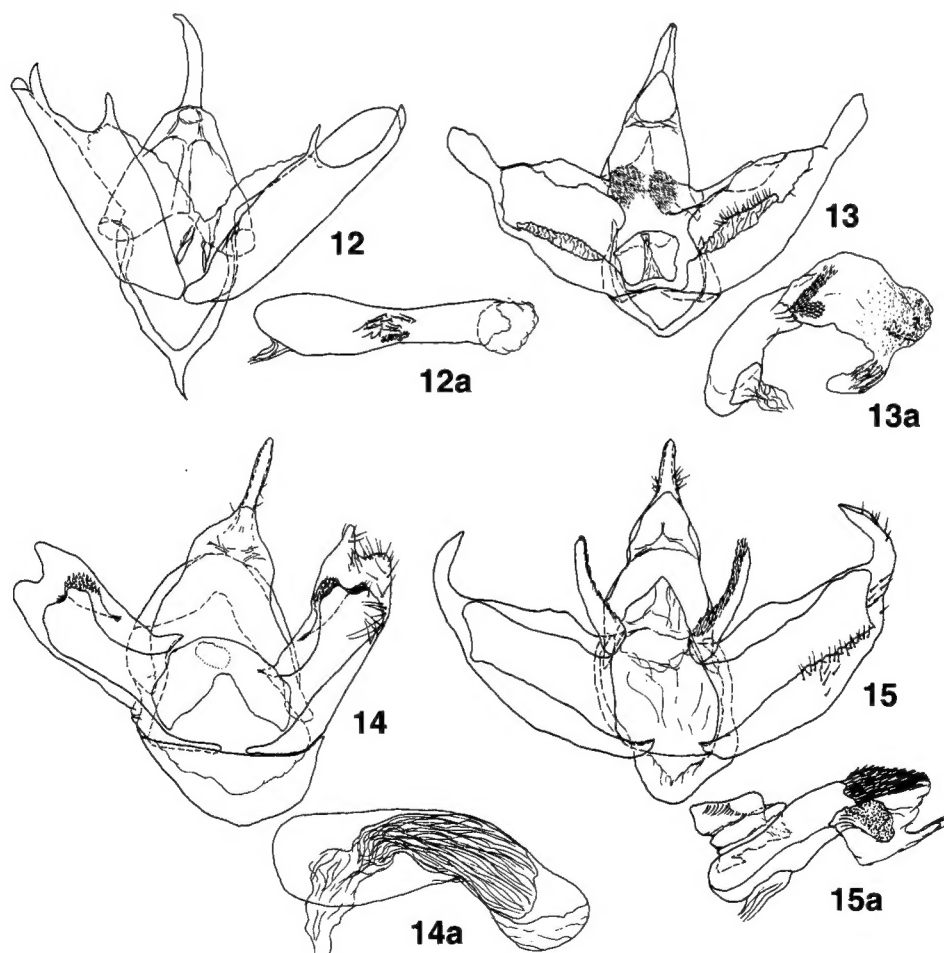
Diacrisiasanniorubroventralis Bryk, 1948. Arkiv. Zool. 41 (A): 44.

Male. Length of forewing 20.4–21.7 mm. Forewing light-yellow, with dark blotch at end of cell; hindwing same colour with dark pattern; fringe of both wings pink.

Female. Length of forewing 20.9–21.4 mm. Forewing orange brown; hindwing dark with orange outer and middle part; fringe as in male.

Male genitalia (Figs 15, 15a). Uncus long, relatively narrow. Vinculum rounded. Valva sclerotized, with a long opening on a ventral side; costa with a digitate process at apex; central part of valva with well-developed knob, bearing with numerous stout, short spines at distal part; distal margin strongly concave. Aedeagus extremely large, robust, longer than valva.

Female genitalia (Figs 17, 17a). Papilla analis broad. Apophysis anterioris much longer than apophysis posterioris, shorter than 1/2 in length. Ductus bursae short, less than 1/4 of corpus bursae, heavily sclerotized in anterior half. Corpus bursae very large, membranous; signa consist of three dentate plates,



Figs 12-15. Male genitalia (a: aedeagus): 12, *Atolmis rubricollis* (L.) ♂; 13, *Arctia flava* (Fuessly), ♂; 14, *Diacrisia irene* ♂; 15, *Parasemia plantaginis* (L.), ♂.

two of them at middle, close and similar in size, the other one smaller, much closer to ductus bursae.

Material examined. 2 ♂, N. Korea; Hyesan (41° 24'N, 128° 10'E); 11 VII 1985 (J. Kozielec); 1 ♀, Korea SW; Heidjou (= Heju); 1? 17 VI 1985 (J. Kozielec); 1 ♀, N. Korea; Sandjiyon (= Samjiyon 41° 50'N, 128° 19'E); 1450 m; 1? 6 VII 1985 (J. Kozielec).

Distribution. Korea, Japan, and Russian Far East.

Remarks. The species has been erroneously cited as *D. sannio* in most of Korean literatures (ESK & KSAF, 1994; Park, 2000), since it was first reported from the Korean peninsula by Fixen (1887). Bryk (1948) described a new subspecies, *D. sannio rubroventralis* Bryk, from Motojondo (= Jucol), N. Korea. However, Dubatolov (1991) noted that the Far Eastern specimens referable to *D. irene* Butler differ from the European and Siberian *D. sannio* (Linnaeus) in the male genitalia. Recently Sugi (1994) changed Japanese species to *D. irene* in the "Edition 1 Post-MJ". An old specimen collected in the Temple Seogwang-sa in N. Korea is deposited in the National Institute of Agricultural Sciences and Technology, Suwon, Korea.

***Hyphoraia aulica* (Linnaeus, 1758)**

(Figs 9– 9, 17)

Phalaena aulica Linnaeus, 1758. Syst. Nat. (ed. 10) 1: 505.

Arctia aulica testidinarioides Sovinsky, 1905. Rus. Entomol. Obozr. 5 (3–4): 109–110.

Hyphoraia aulica rishiriensis Matsumura, 1927. J. Coll. Agric. Hokkaido Imp. Univ. 19: 59, pl. 4.

Female. Length of forewing 17.0–18.5 mm. Forewing light-brown with ovate, yellowish dots; hindwing yellow with black pattern; abdomen yellow with transverse black stripes on each tergite, except the last one.

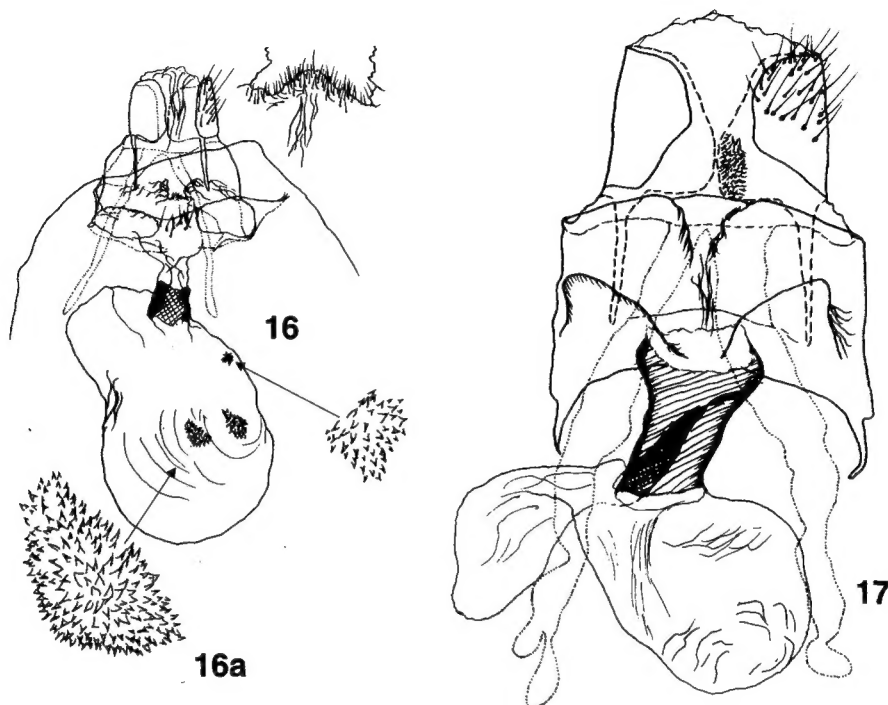
Female genitalia (Fig. 18). Papilla analis broad with group of dense, short hairs dorsally. Apophysis posterioris twice as long as apophysis anterioris. Ductus bursae relatively robust, heavily sclerotized, as long as corpus bursae; ductus seminalis short, with a wide, short ductus, arising from end of sclerotized ductus bursae. Corpus bursae relatively small, membranous; signum absent.

Material examined. 1 ♀, N. Korea; Samjiyon (41° 50'N, 128° 19'E); 1600 m; 2–3 VIII 1989 (E. Palik); 3 ♀, N. Korea, Paekdu-san (= Mt. Paekdu-san, 42° 00'N, 128° 05'E); 2200 m; 3 VIII 1989 (E. Palik).

Distribution. Palaearctic species known from most of the European countries, Siberia (except northern part), China, Korea, and Japan.

Host plants. Various herbaceous plants—especially *Hieracium* L., *Achillea* L. and *Senecio* L. from Europ (Buszko, 1997).

Remarks. The species was reported for the first time from Mt. Kumgang-san, N Korea by Doi (1939), and Kishida & Inomata (1981) who reported it from Yangrim, N Korea (Park, 2000). In Japan, it is known only in Hokkaido. The species seems to be distributed only in the northern part of the peninsula.



Figs 16-17. Female genitalia: 16, *Diacrisia irene* (L.), ♀; 16a, ditto, signum; 17, *Hyphoraia aulica* (L.), ♀.

***Parasemia plantaginis* (Linnaeus, 1758)**

(Figs 10-11, 15, 15a)

Phalaena plantaginis Linnaeus, 1758. Syst. Nat. (ed. 10) 1: 501.

Nemeophila plantaginis macromera Butler, 1881. Trans. Ent. Soc. Lond. 1881: 5.

Nemeophila plantaginis melanomera Butler, 1881. Trans. Ent. Soc. Lond. 1881: 5.

Parasemia plantaginis floccosa Graeser, 1888. Berl. E. Z. 32: 115; Kishida & Inomata, 1981: 199.

Parasemia japonica Inoue & Kobayashi, 1956. Tinea 3: 138, pl. 17.

Parasemia plantaginis jezoensis Inoue, 1976. Bull. Fac. Domest. Sci. Otsuma Wom. Univ. 12: 170, pl. 2.

Parasemia plantaginis melanissima Inoue, 1976. Bull. Fac. Domest. Sci. Otsuma Wom. Univ. 12: 171, pl. 2.

Male. Length of forewing 20.5 mm. Forewing dark with whitish irregular bands; hindwing mostly white with black pattern restricted to outer edge.

Male genitalia (Figs 16, 16a). Uncus elongate. Valva sclerotized; cucullus narrow, elongate; costa developed strongly in the basal part of valva, forming long process covered with tiny but dense, adherent setae. Aedeagus with numerous, dense, large spikes.

Material examined. 1 ♂, N. Korea; Sandjiyon (= Samjiyon 41° 50'N, 128° 19'E); 1450 m, 6 VII 1985

(J. Kozielec).

Distribution. Holarctic species known throughout Europe, Asia and North America.

Host plants. Various herbaceous plants—mainly *Plantago lanceolata* L., *Silene* L. and *Rumex* L. from Europ (Buszko, 1997).

Remarks. This species is another extremely rare Korean arctiid. It was recorded from the Korean peninsula by Matsumura (1930), and cited by Doi (1939) and Kishida & Inomata (1981) (Park, 2000). This new data prove Park's (2000) suggestion that the species is distributed only in North Korea, but intensive field investigations are needed to resolve the problem. Several subspecies, *jezoensis* Inoue, *macromera* (Butler), *melanomera* Inoue, and *melanissima* Inoue, are known in Japan.

REFERENCES

- Buszko, J. 1997. Przadki, zawisaki, niedzwiedzi ki (Lasiocampidae, Endromididae, Lemoniidae, Saturniidae, Sphingidae, Notodontidae, Thaumetopoeidae, Lymantriidae, Arctiidae). *Atlas motyli Polski*. Czesc II. Grupa IMAGE. Warszawa. 262 pp. (in Polish)
- Doi, H. 1939. A list of Heterocera of Korea (7), *Kagakukanpo* 81: 4–6.
- Dubatolov, V.V. 1991. Moths from Southern Sakhalin and Kunashir, collected in 1989. Part 1. Macrolepidoptera, excluding Geometridae and Noctuidae. *Japan. Het. J.* 161: 177–192.
- Dubatolov, V.V., Yu. A. Tshistjakov, and J. Viidalepp. 1993. A list of the Lithosiinae of the territory of the former USSR (Lepidoptera, Arctiidae). *Atalanta* 24(1/2): 165–175.
- Dubatolov, V.V. 1996. 3. A list of the Arctiinae of the territory of the former U.S.S.R. (Lepidoptera, Arctiidae). In Dubatolov V.V. Three contribution to the knowledge of palearctic Arctiinae. *Neue Ent. Nach.* 37: 39–87.
- Fixen, C. 1887. In Romanoff, *Mém. Lépid. Lepidoptera aus Korea*. pp. 233–256.
- Forster, W. and T.A. Wohlfahrt. 1960. Spinnen und Schwärmer (Bombyces und Sphinges). *Die Schmetterlinge Mitteleuropas*. Franckhsche Verl., Stuttgart. 239 pp., 28 pl.
- Inoue, H., S. Sugi, H. Kuroko, S. Moriuti, A. Kawabe, and M. Owada. 1982. *Moths of Japan*. 1: 638–659; 2: 334–341.
- Matsumura, S. 1930. A Catalogue of the Arctiidae of the Japan–Empire. *Ins. Mat.* 5(1,2): 58–94.
- Park, K.T. 2000. Family Arctiidae. *Economic Insects of Korea* 1. Ins. Koreana Suppl. 8, 276 pp.
- Pawlowski, J., and T. Tomek. 1997. Zoological expeditions to the North Korea organized in the years 1971–1992 by the Cracow Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences. *Fragm. Faun.* 40(19): 231–246.
- Pawlowski, J., E. Stworzewicz, and T. Tomek. 2000. Activity of the Cracow Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences in zoological investigation of North Korean Provinces. *Bull. Kor. Assoc. Wildl. Conserv.* 2: 114–139.

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